TEAMS Model for the HPGF LN2 Pump System Diagnostic Utility

Completed Technology Project (2011 - 2012)

Project Introduction

The Testability, Engineering, and Maintenance Systems (TEAMS) Product Suite developed by Qualtech Systems Inc. has been adopted across NASA for integrating diagnostic solutions and creating the diagnostic utility to be autonomous. During upgrades to the High Pressure Gas Facility (HPGF), the Autonomous Monitoring and Managing Utility (AMMU) was imbedded to provide feedback to operators on the control screen. The AMMU collects and correlates historical data for scheduling preventative maintenance as operational degradation is observed.

The engineering design group upgraded the liquid nitrogen pump system at the HPGF. The system supports the site-wide liquid nitrogen supply and its operation is critical for supporting test activities. The new pumping facility was designed with the capability for adding diagnostic utilities for promoting health management of the new cryogenic pump skids. This project will provide the capability by embedding an AMMU for autonomously performing real-time diagnostic feedback. The TEAMS Product Suite from Qualtech systems Inc. (QSI) was used for this project along with the "Remote Diagnosis Server Software Development Kit for TEAMS-RT clients". The project developed a working TEAMS fault model of the cryogen pumping systems. A Diagnosis Server was also created for seamlessly exchanging operational information and diagnostic feedback between the TEAMS real-time engine and the pumping control systems for user displays via the LabVIEW® software interface.

Anticipated Benefits

Benefits to NASA funded missions is that the technology will provide a health management tool to monitor the operational health of the HPGF pumping system used to support rocket engine testing. Further, it is a cost saving tool that prevents the HPGF from being shut down during an inopportune time, interfering with mission and program schedules.

Logo for Office of Chief Technologist

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Center Innovation Fund: SSC CIF

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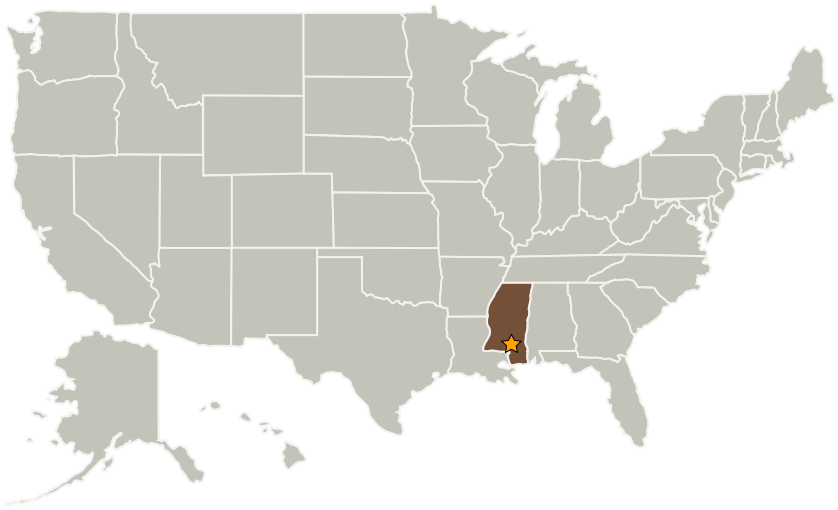
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi

Primary U.S. Work Locations
Mississippi

Project Management

Program Director:
Michael R Lapointe

Program Manager:
Ramona E Travis

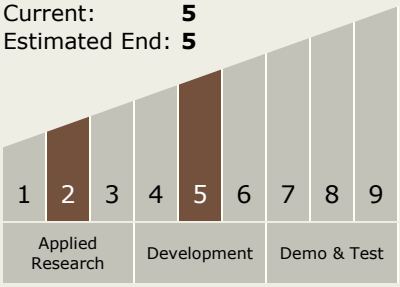
Project Manager:
Scott L Jensen

Principal Investigator:
Scott L Jensen

Co-Investigator:
Andrew K Bracey

Technology Maturity (TRL)

Start: **2**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.1 Infrastructure Optimization
    - TX13.1.2 Launch/Test/Ops Site Management

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Images

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